

A STUDY ON DEVELOPMENT OF PRODUCTS USING NUTRIGENOMICS

PREMIX POWDER AND ITS SENSORY EVALUATION

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ABSTRACT

Our individual metabolic phenotype is the result of the interaction between nutrients and DNA modified gene expression. This is a combination of epigenetic interactions, whereby nutrients modify the structure of DNA, to effect gene expression as well as individual genetic variation, that alerts our response to diet. Nutrigenomics is nutrition, based on genetic variation. Nutrigenomic has also been described by the influence of genetic variation on nutrition, for those who suffer from genome related metabolic diseases. Nutrigenomics health food- tulsi, ginger, carrot and soya bean having the properties, that help to prevent the gene related metabolic diseases. Tulsi is rich in antioxidant, anti-diabetic, maintain good cholesterol, tulsi extract is highly effective as hepatoprotective. Similarly, ginger and soya bean having biological activities antibacterial anticonvulsant, analgesic, antiulcer, gastric antisecretory, antifungal, antitumor, antiallergenic, anti-inflammatory and other activities. Soya bean contains no starch; they are a good source of protein for diabetic people. Tulsi, ginger, carrot and soya bean made to develop premix is prepared by using tulsi, ginger, carrot and soya bean. Developed premix contains tulsi (25%); ginger (10%), carrot (30%), and soya bean (30%). Nutrigenomics premix powder is used for development of standardized products; Nutri powder, cheela, Aloo Tikki, dalia etc.

KEYWORDS: DNA, phenotype, Nutrigenomics, Antibacterial, Anticonvulsant, Analgesic & Antiulcer

Received: Aug 11, 2017; **Accepted:** Sep 11, 2017; **Published:** Oct 13, 2017; **Paper Id.:** IJFSTOCT20173

INTRODUCTION

Diet is a key environmental factor affecting health and the incidence of many chronic diseases. “The new science of Nutrigenomics teaches us, what specific foods tell your genes. What you directly determine the genetic messages your body receives. These messages in turn, control all molecules that constitute your metabolism. The molecules tell your body to burn calories or store them. If can learn the language your gene and control the messages and instructions they give your body and your metabolism, you can radically alter how food interacts with your body, lose weight and optimize your health” (Mark Hyman 2006). Bioactive food constituents such as polyphenol, vitamin, carotenoid and terpenoi having significant beneficial effects, for health promotion and disease treatment, by reducing the process of sustained inflammation that is responsible for chronic disease

In this study, to developed Nutrigenomics health food Premix was made using carrot, ginger, tulsi and soya bean. **Carrot** (*Daucus carota*) is a root vegetable that is orange in colour, though purple, red, white and yellow

variety exists. It is crunchy, tasty and highly nutritious. Carrots are particularly good sources of beta carotene, fibre, vitamin A, K, potassium and antioxidants. The carrot has a number of benefits.

Ginger is underground rhizome *Zingiber officinale* perennial plant and is one of the world's most popular medicinal species. Ginger also claims for use as anti-vomiting and anti-sickness agent. Ginger is extremely low in calories and is an excellent source of thiamine (B1), vitamin C, vitamin E as well as calcium iron magnesium, manganese, phosphorous, sodium and zinc.

Tulsi (basil) is the medicinal plants are widely used by the traditional medical practitioners, for curing various diseases in their day to day practice. In the traditional system of medicine, different parts (leaves, stem, flower, roots, seeds and even whole plant) of *Osimum sanctum* Linn, known as tulsi in Hindi; a small herb seen throughout India, have been recommended for the treatment bronchial asthma, bronchitis, dysentery, diarrhoea, malaria, skin disease, painful eye disease, arthritis, chronic fever, insect bite ect. The *Ocimum sanctum* has also been suggested to possess anti-fertility, antifungal, anticancer, antidiabetic, antimicrobial, cardio protective, hepatoprotective, antiemetic, adoptogenic and diaphoretic actions.

Soya bean (*Glycine max*) is a species of legume, native to East Asia, widely grown for its edible bean, which has numerous uses the plant classed as an oilseed, rather than a pulse, by the United Nation Food and Agriculture Organisation produces significantly more protein per acre, than most other uses of land.

Fat free soya bean meal is a significant and cheap source of protein for animal feeds and many packaged meals. For example, soya bean products such as textured vegetable protein (TVP) are ingredients in many meat and dairy substitutes. The bean contains significant amounts of phytic acid, dietary minerals and B vitamins. Soy vegetable oil used in food and industrial applications, is another product of processing the soya bean crop.

Soya bean is also an excellent source of molybdenum and copper. They are a very good source of manganese, **phosphorous**, and protein as well as a good source of iron, omega-3 fatty acids, dietary fibre vitamin B2 magnesium, vitamin K and potassium. Past several years of clinical and scientific evidences have revealed the medicinal benefits of the soy components against metabolic disorders (cardiovascular, diabetes and obesity, etc.) as well as other chronic diseases (cancer, osteoporosis, menopausal syndrome and anemia etc.)

OBJECTIVE

- To standardized and develop the Products using Nutrigenomics Premix Powder.
- To find out the Organoleptic Evaluation of Nutrigenomics products.

METHOD AND MATERIALS

The experiment was carried out in the research laboratory of the Department of Food and Nutrition, School for the Home Sciences, Babasaheb Bhimrao Ambedkar University Lucknow. The different materials used in the experiment and technique.

The required sample for the experiment is carrot (3kg), soya bean (1kg), tulsi (1/2kg), ginger (250 gram) Raw Materials i.e. carrot, tulsi, ginger, soya bean was procured from the local market of the Lucknow city. The procuring was done in a single lot, to avoid variation and compositional differences so that quality differences could rule out.

A collection of raw materials cleaned and washed them. Peeling and cutting into small pieces of carrot and ginger and dehydrate at 45-50°C for 10-11 hours in the dehydrator, put soya bean for 2-3 days to germination after germination dehydrate it at the 45-50°C for 10-11 hours in a dehydrator and thulsi leaves, sun dried. All dried ingredients grind in grinder for making powder.

Product Development

Development of Nutrigenomics health food products, by using premix powders value added products in different ratios. Four products are prepared such as; aloo tikki, cheela, daliya, nutri powder.

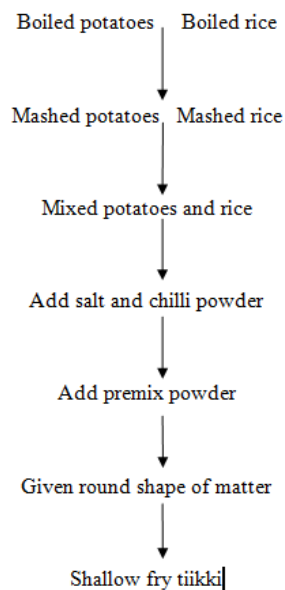


Figure 1: preparation of Aloo Tikki

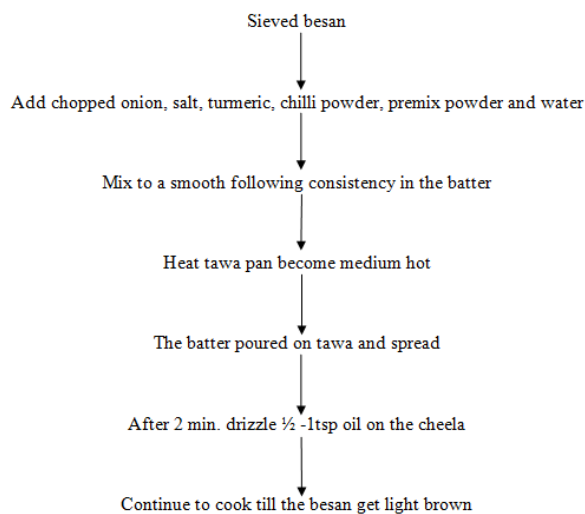


Figure 2: Preparation of Besan Cheela

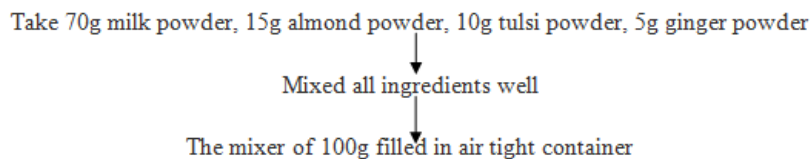


Figure 3: Preparation of Nutri Powder

Nutri powder is made especially for children to promote their health and help to decrease risk lifestyle diseases.

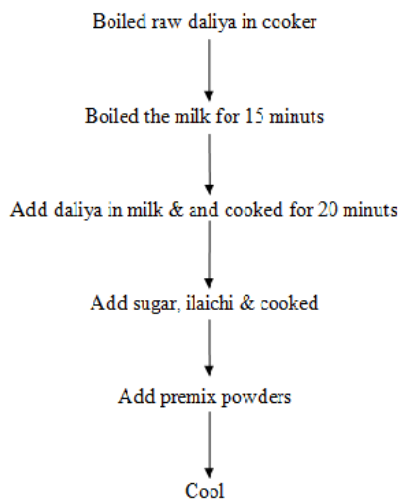


Figure 4: preparation of Daliya

RESULT AND DISCUSSIONS

Sensory Evaluation

Sensory evaluation done by 6 panellist members and including following 5 parameters-

- Texture
- Colour
- Appearance
- Flavour
- Taste

Table 1: Individual Marked for Body and Texture

Members	T1	T2	T3	T4
Member1	8	8	8	7
Member2	8	8	8	8
Member3	7	7	9	8
Member4	8	7	8	8
Member5	7	8	8	7
Member6	7	8	8	9
Total	45	46	58	47

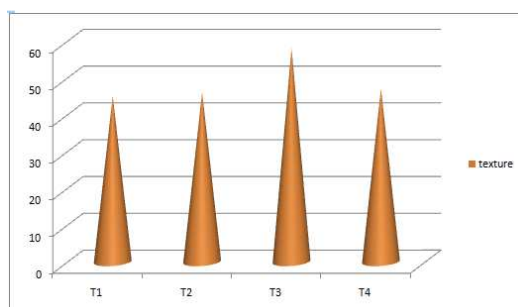


Figure 5: Graphical Representation of Texture

Above graph shows that T3 is most accepted sample in the term of texture among the sensory panellist members and it get highest scoring, then after sample T4, sample T2 and sample T1 respectively.

Table 2: Individual Marked for Colour

Members	T1	T2	T3	T4
Member1	7	8	9	9
Member2	7	8	8	8
Member3	8	8	8	7
Member4	7	7	8	7
Member5	8	8	8	8
Member6	7	8	9	9
Total	44	47	51	48

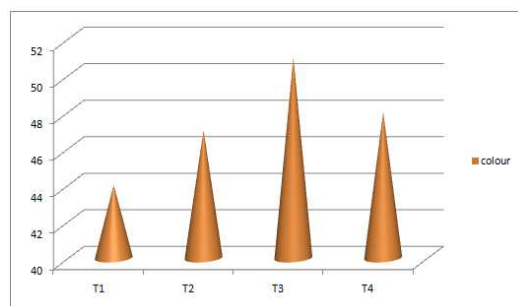


Figure 6: Graphical Representation of Colour

From the graph, it shows that T3 is most accepted sample in the term of colour among the sensory panellist members and it get highest scoring, then after sample T4, sample T2 and sample T1 respectively.

Table 3: Individual Marked for Appearance

Members	T1	T2	T3	T4
Member1	8	8	8	9
Member2	8	8	8	7
Member3	7	8	9	9
Member4	8	7	7	8
Member5	8	7	8	8
Member6	7	8	8	7
Total	46	46	48	48

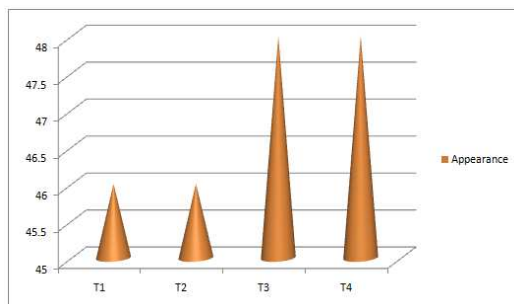


Figure 7: Graphical Representation of Appearance

From the above graph, it shows that sample T3 and sample T4 most accepted among the sensory panellist members during the term of appearance and both samples get same scoring, then after sample T1 and sample T2 get same scoring respectively.

Table 4: Individual Marked for Flavour

Members	T1	T2	T3	T4
Member1	8	8	9	9
Member2	8	8	7	7
Member3	7	7	9	9
Member4	8	8	8	8
Member5	8	8	8	8
Member6	9	7	7	7
Total	48	46	48	48

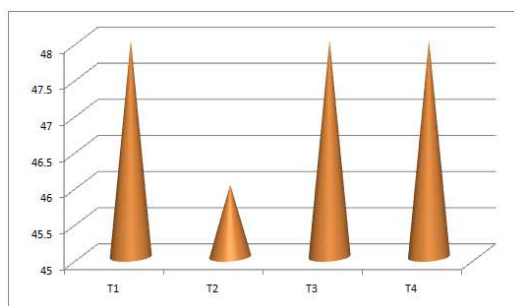


Figure 8: Graphical Representation of Flavour

From this graph, it shows that sample T1, T3, and T4 most accepted in the term of flavour among the sensory panellist members and those sample gets same scoring, the after T2 respectively.

Table 5: Individual Marked for Taste

Members	T1	T2	T3	T4
Member1	8	7	9	9
Member2	9	7	8	8
Member3	8	8	9	9
Member4	7	7	8	8
Member5	8	8	9	8
Member6	8	7	7	8
Total	48	44	50	50

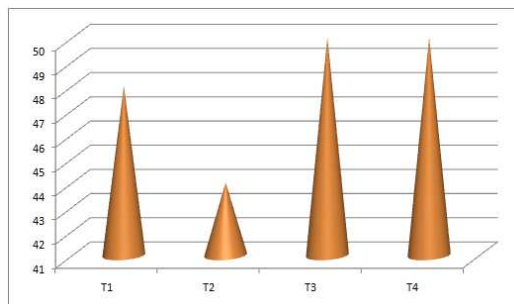


Figure 9: Graphical Representation of Flavour

From this graph, it shows that sample T4 and T3 most accepted in the term of taste among the sensory panellist members and both samples are getting same scoring, then after sample T1 and sample T2 respectively.

Overall Acceptability

Table 6: Individual Marked for Overall Acceptability

Members	T1	T2	T3	T4
Member1	8	8	9	9
Member2	8	8	8	8
Member3	7	8	8	8
Member4	8	8	9	9
Member5	7	7	8	8
Member6	9	7	9	8
Total	47	46	51	50

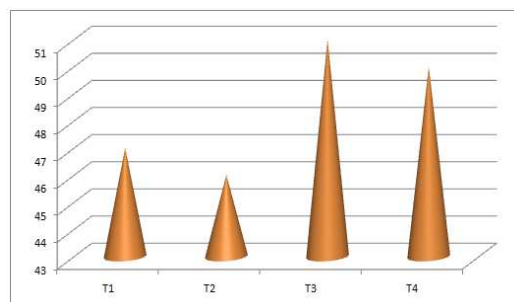


Figure 10: Graphical Representation of Overall Acceptability

From the graph, it shows that overall acceptability of sample T3 was mostly among the sensory panellist members and it gets highest scoring, then after sample T4, T1, and T2 respectively.

Overall Calculation

Overall calculation are done to know most acceptability of the product in all terms of quality of sensory evaluation scoring given by the panellist members, in this all scoring of texture, colour, flavour and taste are calculated in the table, by this we get done statistical analysis and obtained standard deviation, average and other calculations.

Table 7: Overall Calculations

Parameter	T1	T2	T3	T4
1	45	46	48	47
2	44	47	51	48
3	46	46	48	48

Table 7: Contd.,				
4	48	46	48	48
5	48	44	50	50
6	47	46	51	50
Total	278	275	296	291
Average	46.33	45.83	49.33	48.5
Standard deviation	1.63	0.98	1.5	1.22

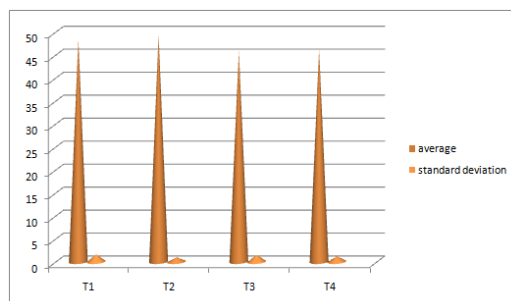


Figure 11: Graphical Representations of Average and Standard Deviation

- In this table of overall calculation we got the average of T1, T2, T3, and T4 are 46.33, 45.83, 49.33, and 48.5 respectively.
- Standard deviations are 1.63, 0.98, 1.5, and 1.22 respectively
- Sample T3 with highest average and lowest standard deviation is most accepted statistically, hence sample T3 is most accepted among all.

CONCLUSIONS

Processed premix powders (carrot, tulsi, ginger, soya bean) and developed the different products using premix powders. Nutrigenomics health food- tulsi, ginger, carrot and soya bean having the properties that prevents the gene related to metabolic disease. Tulsi is rich in anti oxidants; maintain good cholesterol, anti-diabetic, anti-inflammatory and other activities. Soya beans contain no starch and a good source of protein for diabetic people. There were several other Nutrigenomics health food can be taken, and these can also to improve and help to reduce the risk of metabolic diseases which are; green tea, it is used in Crohn's disease, on thermogenesis and energy intake, human prostate cancer, gastrointestinal cancer, skin problems, on weight maintenance after body weight loss, reduce body fat and cardiovascular risk, help prevent breast cancer. The turmeric is used for anti-inflammatory, management of neurodegenerative disease, on lipid profile, cancer chemoprevention, specific inhibition of cyclooxygenase-2 (COX-2) expression by dietary curcumin in HT-29 human colon cancer cell, and inhibition of HIV-1 and HIV-2 prostates with antidepressant activity. Turmeric suppresses the gene that makes inflammatory properties, which is possibly useful in preventing colon cancer and Alzheimer's disease.

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